UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,029	08/29/2001	Sang-Hyun Lee	19570-05384	9521

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EXAMINER
TORRES, JUAN A

ART UNIT	PAPER NUMBER
2631	

DATE MAILED: 09/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/943,029	LEE ET AL.
	Examiner	Art Unit	
	Juan A. Torres	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>09 September 2005</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-9</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-9</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 1-5 are objected to because of the following informalities: in line 4 of claim 1 the recitation "where the phase of of said plurality" is improper; it is suggested to be changed to "where the phase of said plurality". Appropriate correction is required.

Claims 6-8 are objected to because of the following informalities:

a) In lines 14-15 of claim 6 the recitation "of said compare logic means" is improper because the compare logic means has not been mentioned before (lack of antecedent); it is suggested to be changed to "of said compare logic".

b) In lines 15-16 of claim 6 the recitation "to said phase shifting means" is improper because the compare logic means has not been mentioned before (lack of antecedent); it is suggested to be changed to "to said phase shifter".

Appropriate correction is required.

Claims 8 is objected to because of the following informalities: in line 4 of claim 8 the recitation "of said phase control" is improper because the compare logic means has not been mentioned before (lack of antecedent); it is suggested to be changed to "of said phase controller". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply

with the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention.

a) The specification doesn't disclose that the phase of the plurality of sampling

clocks are <u>automatically</u> adjustable.

b) The specification doesn't disclose what <u>is the time distance between a first-</u>

<u>occurring clock of the plurality of clocks and a last-occurring clock of the plurality of</u>

<u>clocks</u>.

c) The specification doesn't disclose that the time distance between a first-

occurring clock of the plurality of clocks and a last-occurring clock of the plurality of

clocks is <u>automatically</u> adjustable.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by Hogge (US

4218771). Hogge discloses a data recovery method for a digital data stream,

comprising sampling input data at multiple points, where the sampling points are

arranged by a predetermined order and adjustable time difference (figure 3 block 23

column 3 lines 49-60); providing a first pseudo bit-error signal that is a result of

comparison of data sampled at an early boundary with recovered data (figure 3 block 33

column 3 line 60-65); providing a second pseudo bit-error signal that is a result of

comparison of data sampled at a late boundary with recovered data (figure 3 block 35

column 3 line 66 to column 4 line 2); and using the first and second pseudo bit-error

signals, so that the sampling boundary is marginally matched to the edge of an eye

opening and one of the intermediate sampling points serves for data recovery (figure 3

block 51 column 4 lines 3-13).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

Claim 1-3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Bergmann (US 4821297) in view of Hogge (US 4218771).

As per claim 1 Bergmann discloses a data recovery apparatus for a digital data

stream of input data, comprising phase shifting means for outputting a plurality of

sampling clocks in a bit time, where the phase of each sampling clock of the plurality of

sampling clocks are automatically adjustable (abstract; figure 6 blocks 16, 14 and 38;

column 3 line 67 to column 4 line 8; column 7 line 21-40; and column 9 lines 42-56.

Bergmann uses the same expression that the Applicant's disclosure he discloses that

the clocks are adjustable); data sampling means for sampling the input data using the

sampling clocks as triggers, and for providing multiple sampled data signals, where one

of the sampled data signals is used to output recovered data (figure 6 blocks 32, 34 and

36, column 7 line 18-21); compare logic means for comparing the sampled data signals

to the recovered data (figure 6 block 20, column 7 line 41-45); and phase controlling

means for estimating the phase relationship between the input data and the plurality of

sampling clocks using the comparison result of the compare logic means, and for

providing control signals to the phase shifting means according to the estimation result

(figure 6 block 20, column 7 line 41-45). Bergmann doesn't specifically disclose a time

distance between a first-occurring clock of the plurality of clocks and a last-occurring

clock of the plurality of clacks is automatically adjustable, (even thought the different in

phase of the clocks $\varnothing_{n+x} - \varnothing_{n-y}$ will be representative of this time distance). Hogge

discloses a time distance between a first-occurring clock of the plurality of clocks and a

last-occurring clock of the plurality of clocks is automatically adjustable (abstract;

column 2 lines 42-44;figures 1-3 the time distance between the three clocks is 2Δ;

column 3 line 6 to column 4 line 13. Hogge expressly indicates that the adjustment is

automatic in the title, column 1 lines 6-8, column 2 lines 66-68 and claims 1-7). Hogge

also discloses automatically adjust the phase of the sampling clocks (title, column 1

lines 6-8, column 2 lines 66-68 and claims 1-7). Bergmann and Hogge teachings are

analogous art because they are from the same field of endeavor. At the time of the

invention it would have been obvious to a person of ordinary skill in the art to

incorporate the automatic clock positioning disclosed by Hogge with the recovery

scheme disclosed by Bergmann. The suggestion/motivation for doing so would have

been to continuously optimized the phase of the clock timing pulses relatively to the

received signal (Hogge abstract). Therefore, it would have been obvious to combine

Hogge with Bergmann to obtain the invention as specified in claim 1.

As per claim 2 Bergmann and Hogge disclose claim 1. Bergmann also discloses

that the phase shifting means comprise phase delay means controlled by a first output

of the phase controlling means for outputting a first sampling clock of the plurality of

sampling clocks using an input clock which is one of an external clock and an internally

recovered clock (figure 6 block 14, column 3 line 31-34); first circuit means controlled by

a second output of the phase controlling means for outputting a second sampling clock

of the plurality of sampling clocks that advances the first sampling clock in phase (figure

6 block 38, column 7 line 26-28); second circuit means controlled by the second output

of the phase controlling means for outputting a third sampling clock of the plurality of

sampling clocks that is delayed from the first sampling clock in phase (figure 6 block 20,

column 7 line 24-25). Hogge also discloses that the phases of the three sampling clocks

are arranged within an eye opening of the input data stream with a predetermined

margin (figure 2 and 3, column 3 line 49-51). Bergmann and Hogge teachings are

analogous art because they are from the same field of endeavor. At the time of the

invention it would have been obvious to a person of ordinary skill in the art to

incorporate the automatic clock positioning disclosed by Hogge with the recovery

scheme disclosed by Bergmann. The suggestion/motivation for doing so would have

been to continuously optimized the phase of the clock timing pulses relatively to the

received signal (Hogge abstract). Therefore, it would have been obvious to combine

Hogge with Bergmann to obtain the invention as specified in claim 2.

As per claim 3 Bergmann and Hogge disclose claim 2. Bergmann also discloses that the first circuit means and the second circuit means receive the first sampling clock (figure 1 and 6 block 16, column 3 line 22-26). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 3.

As per claim 4 Bergmann and Hogge disclose claim 1. Bergmann also discloses that the phase shifting means comprises a phase distributor outputting a plurality of phase shift values (figure 6 block 38, column 7 line 21-40); a buffer receiving input from the phase distributor and outputting a first sampling clock of the plurality of sampling clocks in accordance with a first output of the phase controlling means (figure 1 and 6 block 14 and 38 output, column 3 line 31-35); and selection logic receiving input from the phase distributor and outputting a second and third sampling clock of the plurality of sampling clocks in accordance with a second output of the phase controlling means (figure 6 block 38, column 7 line 21-22). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by

Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 4.

As per claim 5 Bergmann and Hogge disclose claims 1. Bergmann also discloses that the phase shifting means comprises a voltage controlled oscillator controlled by a first output of the phase controlling means, circuit means controlled by a second output of the phase controlling means for outputting three sampling clocks by delaying the output of the voltage controlled oscillator (figure 6 block 16 column 3 lines 34-37; and figure 6 block 38 column 7 lines 13-57). Hogge also discloses that the phases of the three sampling clocks are arranged within an eye opening of input data stream with a predetermined margin (figures 1-3 column 3 line 6 to column 4 line 13). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 5.

As per claim 6 Bergmann discloses a data recovery apparatus for a digital data stream of input data, comprising a phase shifter that outputs a plurality of sampling clocks in a bit time, where the phase of the plurality of sampling clocks are automatically

adjustable (abstract; figure 6 blocks 16, 14 and 38; column 3 line 67 to column 4 line 8;

column 7 line 21-40; and column 9 lines 42-56. Bergmann uses the same expression

that the Applicant's disclosure he discloses that the clocks are adjustable); a data

sampler that samples the input data using the sampling clocks as triggers, and for

providing multiple sampled data signals, where one of the sampled data signals is used

to output recovered data (figure 6 blocks 32, 34 and 36, column 7 line 18-21); compare

logic that compares the sampled data signals to the recovered data (figure 6 block 20,

column 7 line 41-45); and a phase controller that estimates the phase relationship

between the input data and the plurality of sampling clocks using the comparison result

of the compare logic means, and for providing control signals to the phase shifting

means according to the estimation result (figure 6 block 20, column 7 line 41-45).

Bergmann doesn't specifically disclose a time distance between a first-occurring clock

of the plurality of clocks and a last-occurring clock of the plurality of clacks is

automatically adjustable, (even thought the different in phase of the clocks $\varnothing_{n+x}$ - $\varnothing_{n-y}$

will be representative of this time distance). Hogge discloses a time distance between a

first-occurring clock of the plurality of clocks and a last-occurring clock of the plurality of

clocks is automatically adjustable (abstract; column 2 lines 42-44;figures 1-3 the time

distance between the three clocks is 2Δ; column 3 line 6 to column 4 line 13. Hogge

expressly indicates that the adjustment is automatic in the title, column 1 lines 6-8,

column 2 lines 66-68 and claims 1-7). Hogge also discloses automatically adjust the

phase of the sampling clocks (title, column 1 lines 6-8, column 2 lines 66-68 and claims

1-7). Bergmann and Hogge teachings are analogous art because they are from the

same field of endeavor. At the time of the invention it would have been obvious to a

person of ordinary skill in the art to incorporate the automatic clock positioning disclosed

by Hogge with the recovery scheme disclosed by Bergmann. The

suggestion/motivation for doing so would have been to continuously optimized the

phase of the clock timing pulses relatively to the received signal (Hogge abstract).

Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the

invention as specified in claim 6.

As per claim 7 Bergmann and Hogge disclose claim 6. Bergmann also discloses

that the phase shifter comprises phase delay logic controlled by a first output of the

phase controller for outputting a first sampling clock of the plurality of sampling clocks

using an input clock which is one of an external clock and an internally recovered clock

(figure 6 block 14, column 3 line 31-34); first circuit controlled by a second output of the

phase controller for outputting a second sampling clock that advances the first sampling

clock of the plurality of sampling clocks in phase (figure 6 block 38, column 7 line 26-

28); a second circuit, controlled by the second output of the phase controller for

outputting a third sampling clock of the plurality of sampling clocks that is delayed from

the first sampling clock in phase (figure 6 block 20, column 7 line 24-25). Hogge also

discloses that the phases of the three sampling clocks are arranged within an eye

opening of the input data stream with a predetermined margin (figure 2 and 3, column 3

line 49-51). Bergmann and Hogge teachings are analogous art because they are from

the same field of endeavor. At the time of the invention it would have been obvious to a

person of ordinary skill in the art to incorporate the automatic clock positioning disclosed

by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 7.

As per claim 8 Bergmann and Hogge disclose claims 6. Bergmann also discloses that the phase shifter comprises a voltage controlled oscillator controlled by a first output of the phase controller, a circuit, controlled by a second output of the phase controller for outputting three sampling clocks by delaying the output of the voltage controlled oscillator (figure 6 block 16 column 3 lines 34-37; and figure 6 block 38 column 7 lines 13-57). Hogge also discloses that the phases of the three sampling clocks are arranged within an eye opening of input data stream with a predetermined margin (figures 1-3 column 3 line 6 to column 4 line 13). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Juan A. Torres whose telephone number is (571) 272-

3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone

number for the organization where this application or proceeding is assigned is 571-

273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

KEVIN BURD
PRIMARY EXAMINER

Juan Alberto Torres
9-21-2005